WHAT IS CLAIMED IS:

[c01] 1. An alloy comprising, in atom percent:

at least about 50% rhodium;

up to about 49% of a first material, said first material comprising at least one of palladium, platinum, iridium, and combinations thereof;

from about 1% to about 15% of a second material, said second material comprising at least one of tungsten, rhenium, and combinations thereof; and

up to about 10% of a third material, said third material comprising at least one of ruthenium, chromium, and combinations thereof;

wherein said alloy comprises an A1-structured phase at temperatures greater than about 1000° C, in an amount of at least about 90% by volume.

[c02] 2. The alloy of claim 1, wherein a sum of the amount of rhodium in said alloy plus the amount of said first material in said alloy is at least about 75 atom percent.

[c03] 3. The alloy of claim 2, wherein said sum is at least about 85 atom percent.

[c04] 4. The alloy of claim 1, wherein

said second material is present in an amount from about 1 atom percent to about 6 atom percent; and

said third material is present in an amount up to about 8 atom percent, wherein said ruthenium is present in an amount up to about 4 atom percent and said chromium is present

in an amount up to about 6 atom percent.

[c05] 5. The alloy of claim 1, further comprising, in atom percent,

up to about 3% of a fourth material, said fourth material comprising at least one of zirconium, yttrium, hafnium, tantalum, aluminum, titanium, scandium, elements of the lanthanide series, elements of the actinide series, and combinations of any of the foregoing.

[c06] 6. The alloy of claim 5, wherein said fourth material is present in an amount from about 0.1 atom % to about 2 atom %.

[c07] 7. The alloy of claim 5, wherein said alloy further comprises a plurality of oxide particles dispersed throughout said alloy, wherein said oxide particles comprise an oxide of said fourth material.

[c08] 8. The alloy of claim 7, wherein said oxide particles are present in said alloy in an amount up to about 5 volume percent.

[c09] 9. The alloy of claim 6, wherein at least a portion of said fourth material is present as a solute dissolved in said A1 structured phase.

[c10] 10. An alloy comprising, in atom percent,

at least about 50% rhodium;

up to about 49% of a first material, said first material comprising at least one of palladium, platinum, iridium, and combinations thereof;

from about 1% to about 6% of a second material, said second material comprising at least one of tungsten, rhenium, and combinations thereof; and

up to about 8% of a third material, said third material comprising at least one of ruthenium, chromium, and combinations thereof, wherein said ruthenium is present in an amount up to about 4 atom percent and said chromium is present in an amount up to about 6 atom percent; and

up to about 2% of a fourth material, said fourth material comprising at least one of zirconium, yttrium, hafnium, tantalum, aluminum, titanium, scandium, elements of the lanthanide series, elements of the actinide series, and combinations of any of the foregoing;

wherein said alloy comprises an A1-structured phase at temperatures greater than about 1000°C, in an amount of at least about 90% by volume, and wherein a sum of the amount of rhodium in said alloy plus the amount of said first material in said alloy is at least about 85 atom percent.

[c11] 11. An article for use in a high temperature, oxidative environment, said article comprising:

an alloy, said alloy comprising

at least about 50% rhodium;

up to about 49% of a first material, said first material comprising at least one of palladium, platinum, iridium, and combinations thereof;

from about 1% to about 15% of a second material, said second material comprising at least one of tungsten, rhenium, and combinations thereof; and

up to about 10% of a third material, said third material comprising at least one of ruthenium, chromium, and combinations thereof;

wherein said alloy comprises an A1-structured phase at temperatures greater than about 1000° C, in an amount of at least about 90% by volume.

[c12] 12. The article of claim 11, wherein a sum of the amount of rhodium in said alloy plus the amount of said first material in said alloy is at least about 75 atom percent.

[c13] 13. The article of claim 11, wherein

said second material is present in an amount from about 1 atom percent to about 6

atom percent; and

said third material is present in an amount up to about 8 atom percent, wherein said ruthenium is present in an amount up to about 4 atom percent and said chromium is present in an amount up to about 6 atom percent.

[c14] 14. The article of claim 11, wherein said alloy further comprises, in atom percent,

up to about 3% of a fourth material, said fourth material comprising at least one of zirconium, yttrium, hafnium, tantalum, aluminum, titanium, scandium, elements of the lanthanide series, elements of the actinide series, and combinations of any of the foregoing.

[c15] 15. The article of claim 14, wherein said alloy further comprises a plurality of oxide particles dispersed throughout said alloy, wherein said oxide particles comprise an oxide of said fourth material.

[c16] 16. The article of claim 11, wherein said article comprises a component of a gas turbine assembly.

[c17] 17. The article of claim 16, wherein said component comprises at least one of a turbine blade, a turbine vane, and a combustor component.

[c18] 18. The article of claim 17, wherein said component comprises a coating, and said coating comprises said alloy.

[c19] 19. The article of claim 17, wherein said alloy is disposed at at least one component section selected from the group consisting of a leading edge, a trailing edge, and a blade tip.

[c20] 20. A component for a gas turbine assembly, said component comprising:

an alloy, said alloy comprising, in atom percent,

at least about 50% rhodium;

up to about 49% of a first material, said first material comprising at least one of palladium, platinum, iridium, and combinations thereof;

from about 1% to about 6% of a second material, said second material comprising at least one of tungsten, rhenium, and combinations thereof; and

up to about 8% of a third material, said third material comprising at least one of ruthenium, chromium, and combinations thereof, wherein said ruthenium is present in an amount up to about 4 atom percent and said chromium is present in an amount up to about 6 atom percent; and

up to about 2% of a fourth material, said fourth material comprising at least one of zirconium, yttrium, hafnium, tantalum, aluminum, titanium, scandium, elements of the lanthanide series, elements of the actinide series, and combinations of any of the foregoing;

wherein said alloy comprises an A1-structured phase at temperatures greater than about 1000° C, in an amount of at least about 90% by volume, and wherein a sum of the amount of rhodium in said alloy plus the amount of said first material in said alloy is at least about 85 atom percent.

[c21] 21. A method for making an article for use in high temperature, oxidative environments, said method comprising:

providing an alloy, said alloy comprising, in atom percent,

at least about 50% rhodium;

up to about 49% of a first material, said first material comprising at least one of palladium, platinum, iridium, and combinations thereof;

from about 1% to about 15% of a second material, said second material comprising at least one of tungsten, rhenium, and combinations thereof; and

up to about 10% of a third material, said third material comprising at least one of

ruthenium, chromium, and combinations thereof;

wherein said alloy comprises an A1-structured phase at temperatures greater than about 1000° C, in an amount of at least about 90% by volume.

[c22] 22. The method of claim 21, wherein said alloy further comprises, in atom percent,

up to about 3% of a fourth material, said fourth material comprising at least one of zirconium, yttrium, hafnium, tantalum, aluminum, titanium, scandium, elements of the lanthanide series, elements of the actinide series, and combinations of any of the foregoing.

[c23] 23. A method for repairing an article, said method comprising:

providing an article;

providing a repair material, said repair material comprising, in atom percent,

at least about 50% rhodium;

up to about 49% of a first material, said first material comprising at least one of palladium, platinum, iridium, and combinations thereof;

from about 1% to about 15% of a second material, said second material comprising at least one of tungsten, rhenium, and combinations thereof; and

up to about 10% of a third material, said third material comprising at least one of ruthenium, chromium, and combinations thereof;

wherein said alloy comprises an A1-structured phase at temperatures greater than about 1000° C, in an amount of at least about 90% by volume; and

joining said repair material to said article.

[c24] 24. The method of claim 23, wherein a sum of the amount of rhodium in said alloy plus the amount of said first material in said alloy is at least about 75 atom percent.

[c25] 25. The method of claim 23, wherein said repair material further comprises, in atom percent,

up to about 3% of a fourth material, said fourth material comprising at least one of zirconium, yttrium, hafnium, tantalum, aluminum, titanium, scandium, elements of the lanthanide series, elements of the actinide series, and combinations of any of the foregoing.

[c26] 26. The method of claim 25, wherein said repair material further comprises a plurality of oxide particles dispersed throughout said alloy, wherein said oxide particles comprise an oxide of said fourth material.

[c27] 27. The method of claim 23, wherein joining comprises disposing a coating onto said article, said coating comprising said repair material.

[c28] 28. The method of claim 27, wherein disposing said coating comprises disposing said coating by at least one process selected from the group consisting of thermal spraying, plasma spraying, HVOF spraying, and laser deposition.

[c29] 29. The method of claim 23, wherein joining comprises at least one of welding, brazing, and diffusion bonding.

[c30] 30. The method of claim 23, wherein said article comprises a component of a gas turbine engine selected from the group consisting of a blade, a vane, and a combustion component.

[c31] 31. The method of claim 30, wherein joining comprises disposing said repair material at at least one component section selected from the group consisting of a leading edge, a trailing edge, and a blade tip.

[c32] 32. A method for repairing a gas turbine engine component, said method comprising:

providing at least one gas turbine engine component selected from the group consisting of a blade, a vane, and a combustion component;

providing a repair material, said repair material comprising, in atom percent,

at least about 50% rhodium;

up to about 49% of a first material, said first material comprising at least one of palladium, platinum, iridium, and combinations thereof;

from about 1% to about 6% of a second material, said second material comprising at least one of tungsten, rhenium, and combinations thereof; and

up to about 8% of a third material, said third material comprising at least one of ruthenium, chromium, and combinations thereof, wherein said ruthenium is present in an amount up to about 4 atom percent and said chromium is present in an amount up to about 6 atom percent; and

up to about 2% of a fourth material, said fourth material comprising at least one of zirconium, yttrium, hafnium, tantalum, aluminum, titanium, scandium, elements of the lanthanide series, elements of the actinide series, and combinations of any of the foregoing;

wherein said alloy comprises an A1-structured phase at temperatures greater than about 1000° C, in an amount of at least about 90% by volume, and wherein a sum of the amount of rhodium in said alloy plus the amount of said first material in said alloy is at least about 85 atom percent; and

joining said repair material to said component by disposing said repair material at at least one component section selected from the group consisting of a leading edge, a trailing edge, and a blade tip.